

WHAT IS CLAIMED IS

1. A display assembly with two superposed contrast inversion display devices including a first display device, a second active display device having a double structure, one structure being formed by a liquid crystal dot matrix display cell or by a digit liquid crystal display cell, said liquid crystals being confined in a space delimited by two transparent substrates and having two switching states, and the other structure being formed by a liquid crystal optical valve, said liquid crystals being confined in a space delimited by two transparent substrates and having at least two switching states and control means allowing an appropriate voltage to be selectively applied to the cell and/or to all or part of the valve to cause them to switch from one state to another, wherein a first polariser is arranged at the front of the display cell and in that a second polariser is arranged at the back of the valve so that, when the cell is switched to display at least one item of data, the total or partial switching of the valve, from one state to another, inverts the contrast of the data displayed from a light appearance to a dark appearance or vice versa, as a function of the light or dark shade of the first display device, and the absorbent or reflective nature of the polariser placed at the back of the second display device.
2. A display assembly according to claim 1, wherein the switching of the valve from one state to another also allows either the first display only to be made visible, or it to be totally hidden by a mirror mask or by a black mask when the cell is not switched.
3. A display assembly according to claim 1, wherein the valve includes at least two distinct zones with opposite switching mode, so that two types of data of the second display can be observed with a contrast inversion.
4. A display assembly according to claim 1, wherein the liquid crystals of said display assembly are of the twisted nematic type with either positive or negative anisotropy, which may be identical or different in the cell and in the valve.
5. A display device according to claim 4, wherein the first display device has a dark shade, the front polariser of the second display device is of the absorbent or reflective type and the back polariser is of the reflective type while being crossed with the front polariser or parallel thereto.
6. A display assembly according to claim 4, wherein the first display device has a light shade, the front polariser is of the absorbent or reflective type and the back polariser is of the absorbent type while being crossed with the front polariser or parallel thereto.

7. A display device according to claim 1, wherein the transparent substrates opposite the cell and the valve are combined in a single transparent substrate.

8. A display assembly according to ^{Claim 1} ~~any of claims 1 to 7~~, wherein the first display device is selected from among an analogue device, a digital device, a combination of these two devices and a decorative element.

9. A display device according to claim 7, wherein the digital part of the first display device has a comparable structure to that of the second display device.

10. A timepiece including a case closed by a crystal and a back cover in which a clockwork movement associated with at least one display device is housed, characterised in that said display device is formed by a display assembly according to ^{Claim 1} ~~any of claims 1 to 9~~, said first display device essentially displaying time related data and said second display device displaying time related data complementary to the preceding data or non time related data of sensor systems or, processing systems, for example alphanumerical, integrated in the case of said timepiece.

11. A timepiece according to claim 10, wherein said first display device includes a dial above which move an hour hand, a minute hand and a second hand.

12. A timepiece according to ^{Claim 10} ~~claims 10 and 11~~, wherein the second display device is combined with the crystal.

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